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        voza; ZOLOTAREV, V.N., mashinist instruktor; YANIN, I.A.,
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red.; MURAV'YEVA, N.D., tekhn. red.

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nosa kontaktnykh provodov; opyt raboty kollektiva Zapadno-
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RAKOV, V.A., red.

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sostav zheleznykh dorog. Izd.2., perer. Moskva, Trans-
port, 1964. 498 p.   (MIRA 18:1)

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       24 no.10:50-51 O '58.   (MIRA 12:2)

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               (Electric switchgear)

31057
S/126/61/012/004/019/021
E073/E535

24.22 00

AUTHORS: Dunayev, F.N. and Kalinin, V.M.

TITLE: On the longitudinal and transverse magnetostriction
of electrical steel

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.4, 1961,
619-620

TEXT: Earlier investigations by V. V. Druzhinin et al.
(Ref.1: FMM, 1957, 5, 164; Ref.2: Zavodskaya laboratoriya, 1954,
2, 207) on iron-silicon alloys containing 0.4 to 7.0% Si, using
wire strain gauges which were not glued onto the specimens,
showed that in most cases the transverse magnetostriction as well
as the longitudinal magnetostriction had positive values.   The
authors of this paper carried out experiments with glued on
strain gauges which yielded data differing from those obtained by
Druzhinin et al.   The measurements were made on 250 x 30 mm^2
strips and 30-45 mm diameter discs of various steels.   To
eliminate the influence of possible bending on the measured
results, the strain gauges forming the arms of the measuring
bridge were glued on in pairs to both sides of the specimen. The

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On the longitudinal and ...

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sensitivity of the metering arrangement was about 10^{-7} mm^{-1}.
Magnetization was by means of a solenoid. The main results on
the longitudinal and transverse magnetostriction are entered in
a table, where λ_{max} is the maximum magnetostriction on the
$\lambda(H)$ curve and λ_s is the magnetostriction in a magnetic field of
1200 Oe. It can be seen from the table that in the case of the
hot-rolled steels Э11 (E11), Э31 (E31), Э42 (E42) and the cold-
rolled steel Э310 (E310) the longitudinal magnetostriction $\lambda_{\parallel}$
and the transverse magnetostriction $\lambda_{\perp}$ have opposite signs.
One of the possible causes why Druzhinin obtained positive values
for $\lambda_{s\perp}$ is interaction of the strain gauge wire, along which
there is a flow of d.c. current, with the magnetic fields of the
electromagnet and the specimen.   There are 1 table and
3 references: all Soviet.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni
               A. M. Gor'kogo (Ural State University imeni
               A. M. Gor'kiy)

SUBMITTED: March 24, 1961

Card 2/3

S/126/61/012/006/019/023
E073/E535

AUTHORS: Dunayev, F.N. and Kalinin, V.M.

TITLE: On the effect of shape in linear magnetostriction

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.6, 1961,
                915-917

TEXT: H. E. Stauss (Ref.5: J.Appl.Phys., 1959, 30, 698)
has shown that the shape effect for an ellipsoid in a longitudinal
uniform field represents deformation by compression and he
proposed a formula for calculating the shape effect when
magnetizing the specimen above saturation. Stauss has also shown
that in the general case the shape effect includes not only the
change of the magnitude of deformation of the specimen as a
result of interaction of the magnetic poles but also the change
in deformation caused by interaction of these poles with the
magnetizing apparatus. To determine the effect of shape, the
authors used 5 x 5 mm rods, 100 mm long and additional 200 mm rods
of the same cross-section and the same material. Specimens of
iron with silicon contents of 1.05 and 4.10% were chosen, to obtain
a low magnetostriction and a sufficiently high saturation

Card 1/3

On the effect of shape in ..   S/126/61/012/006/019/023
                                      E073/E535

magnetization; this enabled easier detection of the influence of
shape.   After machining, the specimens were subjected to high
temperature annealing in vacuo at 1100°C for two hours. The
linear magnetostriction and the magnetization were measured
initially on the 100 mm long specimen on its own and then on this
same specimen to which was added the 200 mm long specimen. The
magnetostriction was measured by glued-on strain gauges the
magnetization was measured ballistically using a differential coil.
The solenoid used had a uniform field for a length of 580 mm and
a maximum field strength of 1200 Oe.   The results. which are
plotted in the paper, indicate that for the specimen containing
1.05% Si, for which the magnetostriction changes from positive to
negative, as well as for the specimen containing 4.1% Si, for
which the magnetostriction has only positive values. the difference
in the magnetostriction values $\Delta A_{\parallel}$ of the short specimen and the
specimen with the longer one added is negative for the same value
of magnetization.   The dependence of $\Delta A_{\parallel}$ on the square of the
magnetization I^2 is approximately linear.   However, additional
investigations are required on this point. since the experimental

Card 2/3

On the effect of shape in ...   S/126/61/012/006/019/023
                                        E073/E535

values are such that they would allow plotting a curve which is
slightly convex viewed from the I^2 axis.   There are 2 figures
and 6 references: 1 Soviet-bloc and 5 non-Soviet-bloc.
The English-language references read as follows: Ref.2: Birss R.
Adv.Phys., 1959, 8, No.31, 252; Ref.3: Gersdorf R.J. J.Appl.Phys.,
1959, 30, 2018; Ref.4: Gersdorf R. Physica, 1960, 26, 553;
Ref.5: Quoted in text.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo
             (Ural State University imeni A. M. Gor'kiy)

SUBMITTED: May 10, 1961

Card 3/3

DUNAYEV, F.N.; KALININ, V.M.

Longitudinal and transverse effect of the shape of ellipsoid
specimens of iron-silicon alloys. Fiz.met.i metalloved. 13
no.1:153-154 Ja '62.   (MIRA 15:3)

1. Ural'skiy gosudarstvennyy universitet imeni Gor'kogo.
          (Iron-silicon alloys--Testing)

DUNAYEV, F.N.; KALININ, V.M.

Effect of the longitudinal and transverse shape on the magneto-
striction of iron ellipsoids. Fiz. met. i metalloved. 14 no.3:
462-464 S '62.   (MIRA 15:9)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
                         (Magnetostriction)

DUNAYEV, F.N.; KALININ, V.M.; SERIKOV, V.V.

Anisotropy of volumetric magnetostriction. Fiz.met.i metalloved.
14 no.5:781-783 N '62.   (MIRA 15:12)

1. Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo.
                    (Magnetostriction)

S/126/63/015/002/002/033
E039/E420

AUTHORS: Dunayev, F.N., Kalinin, V.M.

TITLE: Volume magnetostriction of iron and iron-silicon alloys

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.2, 1963,
170-174

TEXT: An experimental investigation of the dependence of volume
magnetostriction on composition for Si content from 0 to 6.79% by
weight.   Experimental data on the magnitude, sign and
characteristics of the change in volume magnetostriction provide
valuable information on magnetic and exchange interactions in
ferromagnetics.   Samples are prepared in the form of ellipsoids
of revolution with major axes of about 150 mm and minor axes of
about 5 or 10 mm, giving volumes of about 2300 and 7700 mm³
respectively.   All samples were heated at 900°C in a vacuum for
3 hours and then cooled at 100°C per hour.   The volume magneto-
striction was measured by a dilatometric method using distiled
water as the dilatometer fluid.   Fields of up to 5000 Oe were
provided by means of a solenoid and errors of measurement were
about 5%.   It is shown that the volume magnetostriction ω
depends linearly on the field H for Fe and Fe-Si alloys over the
Card 1/2

Volume magnetostriction ...

S/126/63/015/002/002/033
E039/E420

range 600 to 5700 Oe.   Over the investigated range the value of $\partial\omega/\partial H$ increases with increase in Si content from $6.4 \times 10^{-10} Oe^{-1}$ for pure iron, to $13 \times 10^{-10} Oe^{-1}$ for the alloy with 6.79% Si.   The isotropic constant for true magnetostriction is calculated and varies from 2.13×10^{-10} for pure iron to 4.33×10^{-10} for the 6.79% Si alloy.   The dependence of $\partial\omega/\partial H$ on Si content is due to the increase in the critical exchange integral.   Over the investigated range the points for the Fe-Si alloys are displaced to the left of the Bethe-Slater curve.   There are 2 figures and 1 table.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo
             (Ural State University imeni A.M.Gor'kiy)

SUBMITTED: June 30, 1962

Card 2/2

DUNAYEV, F.N.; KALININ, V.M.; DRUZHININ, V.V.

Longitudinal and transverse magnetostriction of iron-silicon
steels. Fiz. met. i metalloved. 15 no.5:652-657 My '63.
(MIRA 16:8)

1. Ural'skiy gosudarstvennyy universitet im. Gor'kogo i
Verkh-Isetskiy metallurgicheskiy zavod.
(Iron-silicon alloys—Magnetic properties)

ADAMESKU, R.A.; KALININ, V.M.; KUDRYAVTSEV, I.P.

> Effect of annealing in a magnetic field on the magnetic and
> crystalline structure of ferrosilicon. Izv. vys., ucheb. zav.;
> fiz. no.5:69-74 '64.   (MIRA 17:11)
>
> 1. Ural'skiy politekhnicheskiy institut imeni Kirova i Ural'skiy
> gosudarstvennyy universitet imeni Gor'kogo.

L 62911-65   EWT(m)/EWP(w)/EWA(d)/EWT(t)/EWP(z)/EWP(b)   JD/JM

ACCESSION NR: AR5019140   UR/0137/65/000/007/1026/1026

SOURCE: Ref. zh. Metallurgiya, Abs. 7I169

AUTHOR: Dunayev, F. N.; Kalinin, V. M.

TITLE: Longitudinal, transverse, and volumetric effect of the shape of ferromagnetic materials
CITED SOURCE: Sb. Fiz. magnitn. yavleniy. Sverdlovsk, 1964, 57-76

TOPIC TAGS: ferromagnetic material, polycrystal, compressive stress, tensile stress, external magnetic field, homogeneous magnetic field

TRANSLATION: The longitudinal effect of the shape ΔA_{11} of polycrystalline ferromagnetic materials in a homogeneous external magnetic field consists of compression strain, and not of dilatational strain. For determination of the magnitude of the spontaneous longitudinal magnetostriction in samples with a sufficiently large demagnetization factor, it is necessary not to calculate, but to add the value of ΔA_{11} to the measured magnitude of λ_{IIs}. The transverse effect of

Card 1/2

L 62914-65

ACCESSION NR: AR5019140

the shape ΔA_{22} of polycrystalline ferromagnetic materials consists of dilatational strain. To determine the magnitude of the spontaneous transverse magnetostriction from the measured value of $\lambda_{\perp s}$, it is necessary to calculate ΔA_{22}. The volumetric effect of the shape of polycrystalline samples consists of expansion strain. The longitudinal effect of the shape of a sample located between the poles of an electromagnet changes its sign with a change in the distance between the samples and the poles. With small gaps, this effect consists of dilatational strain, while with large gaps it consists of compression strain. (From RZh Fiz.)

SUB CODE: MM   ENCL: 00

Card 2/2

L 23679-66   EWT(l)/EWT(m)/EWA(d)/EWP(t)/EWP(k)   IJP(c)   JD/HW

ACC NR: AR6005239   SOURCE CODE: UR/0058/65/000/009/E134/E135

SOURCE: Ref. zh. Fizika, Abs. 9E1111

AUTHORS: Dunayev, F. N.; Kalinin, V. M.; Maysinovich, V. I.

TITLE: Anisotropy of longitudinal, transverse, and volume shape effect

REF SOURCE: Sb. Fiz. magnitn. yavleniy. Sverdlovsk, 1964, 77-85

TOPIC TAGS: magnetostriction, steel, material deformation, magnetic anisotropy/ E310 steel

TRANSLATION: With the aid of the method of strain-gauge pickups, the authors investigated the longitudinal and transverse magnetostriction $\lambda_\parallel$ and $\lambda_\perp$ of single crystals of cold-rolled steel E310. It is established that with decreasing diameter of a sample prepared in the form of a disc whose surface coincides with the (110) plane, i.e., with increasing demagnetizing factor, the magnetostriction $\lambda_\parallel$ in the [100] direction, which has a positive sign, decreases for each value of the field H, i.e., the disc experiences compression deformation, due to the shape effect, in the direction of the field H. However, the variation of $\lambda_\parallel$ can be also influenced by the change in the magnetic structure. The magnetostriction $\lambda_\perp$ in the [100] direction has a negative sign and it also decreases in absolute magnitude with decreasing diameter. In the [110] direction, the value of $\lambda_\parallel$ is also positive and also decreases with decreasing diameter, whereas $\lambda_\perp$, which has a negative sign, increases in absolute magnitude. In the [111] direction, $\lambda_\parallel$ and $\lambda_\perp$ are negative and decrease in absolute magnitude with

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L 23679-66

ACC NR: AR6005239   0

decreasing diameter. The volume magnetostriction ω depends on the direction of the
magnetic field H relative to the rolling direction (the [100] direction). In the
initial section the ω(H) curves have a parabolic form. The greatest deformation of
the sample for a given value of the field H is absorbed in the case of magnetization
along [100], and the smallest in the case of magnetization along [111]. For fields
up to 400 oe, a ratio ω[100]:ω[110]:ω[111] = 3:2:1 is observed, and is explained on
the basis of the theory of R. Becker (Z. Phys., 1934, 67, 547). N. Smol'kov.

SUB CODE: 20

Card 2/2 fV

L 23680-66   EWT(1)/EWT(m)/EWA(d)/EWP(t)/EWP(k)   IJP(c)   JD/HW

ACC NR: AR6005240   SOURCE CODE: UR/0058/65/000/009/E135/E135

AUTHORS: Dunayev, F. N.; Kalinin, V. M.; Maysinovich, V. I.

TITLE: Crystalline effect and exchange magnetostriction of the paraprocess in iron-silicon alloys

SOURCE: Ref. zh. Fizika, Abs. 9E1112

REF. SOURCE: Sb. Fiz. magnitn. yavleniy. Sverdlovsk, 1964, 86-99

TOPIC TAGS: paramagnetism, magnetostriction, iron alloy, silicon containing alloy, magnetic anisotropy, heat treatment, steel/E310 steel

TRANSLATION: The authors investigated the volume magnetostriction in the region of the crystalline effect (ω_c) and of the paraprocess (ω_p) of polycrystalline samples of cold rolled E310 steel with texture (110) [001]. The polycrystalline samples had the form of ellipsoids of revolution and plates, whose shape ensured homogeneous magnetization in a homogeneous magnetic field. All the samples were annealed in vacuum of 10^{-4} mm Hg at 900C for four hours with subse-

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L 23680-66

ACC NR: AR6005240

quent cooling at a rate of 50°/hr. The value of ω was determined by a dilatometric method. The sensitivity of the installation in measurement of ellipsoidal samples was 5×10^{-8}, and that of the plates was 1.8×10^{-8}. The magnetization was carried out in a solenoid, which made it possible to obtain a magnetic field up to 6000 Oe, uniform within 5% in a section 150 mm long. The measurement error was 2 -- 5%. It is shown that $\partial\omega_p/\partial H$ increases with increasing Si content from 6.4×10^{-10} for Fe to 13×10^{-10} Oe^{-1} for an alloy containing 6.79% Si. This is brought about by the fact that the 'slope' of the effective exchange integral essentially increases, apparently because of the decrease in the lattice parameter with increasing Si content. ω_c of cold rolled steel was investigated. The largest value of ω_c was observed in the [111] direction, and the smallest in the [100] direction. Measurement of ω_c of single crystals make it possible to determine the value of $(K_1)^{-1}\partial K_1/\partial P$ which characterizes the change in the magnetic anisotropic constant

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ACC NR: AR6005240

during hydrostatic compression. For an alloy with 3.2% Si,
$(1/K_1)\partial K_1/\partial P \approx -70 \times 10^{-7}$ atm^{-1}. An anisotropy of ω_p is observed.
Yu. Avraamov.

SUB CODE: 20

Card   3/3

DUNAYEV, F.N.; KALININ, V.M.; MAYSHOVICH, V.I.

Anisotropy of the crystal effect of the volume magnetostruction
in the spin paramagnetism of iron-silicon alloys. Fiz. met. i
metalloved. 18 no.2:318-320 Ag '64.

(MIRA 18:8)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.

KALININ, V.M.

Calculation of sums, integralov, and products. Vest LGU no.7:63-67 '65. (MIRA 18:5)

DUNAYEV, F.N.; KALININ, V.M.; KRYUKOV, I.P.; MAYSINOVICH, V.I.

Magnetization saturation of the Co-Pt alloy. Fiz. met. i
metalloved. 20 no.3:460-462 S '65.

(MIRA 18:11)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo
i Institut fiziki metallov AN SSSR.

L 46286-66   EWT(m)/EWP(t)/ETI   IJP(c)   JD/HW/JG

TITLE: The magnetic saturation intensity of Co-Pt alloy

TOPIC TAGS: cobalt alloy, platinum alloy, magnetic saturation , TEMPERATURE.
DEPENDENCE

ABSTRACT: The thermal dependence of the specific magnetic saturation intensity of a Co-Pt
alloy of nearly equiatomic composition was determined from liquid nitrogen temperature to
700K, in order to study the nature of the high coercivity of such magnets. Spherical samples
of 3.8 mm diam were prepared. Their specific magnetic saturation intensity was measured
after 30 min heating at 1000C, cooling at a rate of 1.3C/sec, and annealing 3, 6, 9, or 13 hr
at 600C using fields up to 80kOc for magnetization. The specific magnetic saturation intensity
increased with field strength and decreased with annealing time and with the temperature at
magnetization, reaching a maximum of 43.5 G·cm^3·g^{-1} for tempered and not annealed samples.
The results indicate that magnetization of the tetragonal and well defined phase, formed during

Card 1/2   UDC: 538.114:248

L 46286-66

ACC NR: AP5025863

the annealing process, is 35—40% lower than that of the cubic disordered phase generated at
850C and higher temperatures. The authors thank R. Z. Levitin for making available informa-
tion on the method of measuring magnetization in pulse fields before its publication. Orig. art.
has: 3 figures.

SUB CODE: 11,20/   SUBM DATE: 21Aug64   /   ORIG REF: 004/   OTH REF: 002

hS

Card   2/2

L   .   .72-62   ...T(m)/...T(t)/...T   1JP(c)   JD

ACC NR: AR6033793   SOURCE CODE: UR/0058/66/000/007/E110/E110   3/

AUTHOR: Mishin, D. D.; Novikov, V. F.; Kalinin, V. M.

TITLE: The coercive force of plastically deformed ferrosilicon crystals

SOURCE: Ref. zh. Fizika, Abs. 7E830

REF SOURCE: Uch. zap. Ural'skogo un-ta. Ser. fiz., vyp. 1. 1965, 63-68

TOPIC TAGS: iron, silicon single crystal, plastic deformation, ferrosilicon, anistropy

ABSTRACT: The anisotropy of the coercive force H_c and the magneto-striction saturation λ_s of Fe-Si single crystals deformed by stretching in the direction [110] (110) was investigated. Research was conducted on disk-shaped samples. H_c measurements were made in three basic crystallographic directions on an astatic magnetometer with a 700-erg magnetizing field. Tensometric measurements were made of λ_s in fields of up to 1900 erg. Measurements showed that plastic deformation of Fe-Si single crystals in the direction [110] (110) causes a quantitative change in the H_c value and a qualitative change in the H_c anisotropy. The inequality of $H_{c[100]} < H_{c[111]} < H_{c[110]}$ is fulfilled in the 0—92% range. The inequality of $H_{c[001]} > H_{c[111]} > H_{c[110]}$ is fulfilled for

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L 08327-67

ACC NR: AR6033793

O

9.2—23% deformation. When deformation exceeds 23%, the first correlation enters into effect. From the results of measurements, it follows that the process of change of H_c depends essentially on the direction of deformation. P. Khramov. [Translation of abstract]

SUB CODE: 08, 20/

Card 2/2 nst

L 17831-66   EWT(d)/T   IJP(c)
ACC NR: AP6004383   SOURCE CODE: UR/0020/66/166/003/0530/0532

AUTHOR: Kalinin, V. M.

ORG: none

TITLE: Asymptotic expansions for frequently encountered probability distributions

SOURCE: AN SSSR. Doklady, v. 166, no. 3, 1966, 530-532

TOPIC TAGS: asymptotic expansion, probability, distribution function, normal distribution, polynomial

ABSTRACT: The problem of refining the limit theorems on the convergence of binomial and polynomial distributions to normal and Poisson, Student distributions to normal, etc., is formulated. Let $\lambda_1, \ldots, \lambda_{k-1}$ be fixed positive numbers; $m_1, \ldots, m_{k-1}$ fixed nonnegative integers; $\lambda = \lambda_1 + \ldots + \lambda_{k-1}$, $m = m_1 + \ldots + m_{k-1}$, $m_k =$ $n - m$. Then for any $k = 2, 3, \ldots$ the asymptotic expansion

$$\frac{n!}{m_1! \ldots m_k!}(\lambda_1/n)^{m_1} \ldots (\lambda_{k-1}/n)^{m_{k-1}}(1 - \lambda/n)^{m_k} =$$

$$= \left(\prod_{i=1}^{k-1} \frac{\lambda_i^{m_i} e^{-\lambda_i}}{m_i!}\right) \exp\left[\sum_{j=1}^{\infty} \frac{\mathscr{L}_j(m, \lambda)}{n^j}\right] = \left(\prod_{i=1}^{k-1} \frac{\lambda_i^{m_i} e^{-\lambda_i}}{m_i!}\right)\left[1 + \sum_{j=1}^{\infty} \frac{M_j(m, \lambda)}{n^j}\right].$$

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L 17831-66
ACC NR: AP6004383

is valid when $n \to \infty$. Let λ be a fixed positive number, and m be a fixed nonnegative integer. The asymptotic expansion

$$\sum_{l=0}^{m} C_n^l \left(\frac{\lambda}{n}\right)^l \left(1 - \frac{\lambda}{n}\right)^{n-l} = F(m) + \sum_{j=1}^{\infty} \frac{V_j(m, \lambda)}{n^j}$$

is valid when $n \to \infty$. When $\lambda \to \infty$, in any finite interval $a \leq y \leq b$:

$$\frac{\lambda^m e^{-\lambda}}{m!} = \frac{e^{-y^2/2}}{\sqrt{2\pi\lambda}} \exp\left[\sum_{j=1}^{\infty} \frac{W_j(y)}{(\sqrt{\lambda})^j}\right].$$

Uniformly for all m_1 for which y_i are within arbitrary finite intervals $a_i \leq y_i \leq b_i$, when $n \to \infty$

$$\frac{n!}{m_1! \ldots m_k!} p_1^{m_1} \ldots p_k^{m_k} = \frac{\exp\left[-\frac{1}{2}\sum_{i=1}^{k} q_i y_i^2\right]}{(\sqrt{2\pi n})^{k-1} \sqrt{p_1 \ldots p_k}} \exp\left[\sum_{j=1}^{\infty} \sum_{l=1}^{k} \frac{Q_{jl}}{(\sqrt{n p_l})^j}\right].$$

For $k = 2$,

$$C_n^m p^m q^{n-m} = \frac{e^{-y^2/2}}{\sqrt{2\pi n p q}} \exp\left[\sum_{j=1}^{\infty} \frac{Q_j(y)}{(\sqrt{n p q})^j}\right] =$$

$$= \frac{e^{-y^2/2}}{\sqrt{2\pi n p q}} \left[1 + \sum_{j=1}^{\infty} \frac{T_j(y)}{(\sqrt{n p q})^j}\right].$$

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L 17831-66

ACC NR: AP6004383

When $n \to \infty$, at an arbitrary fixed θ uniformly relative to $a \leq y_1 \leq y_2 \leq b$

$$\sum_{i=-\nu+1}^{\nu+m} C_n^i p^i q^{n-i} = \int_{y_1}^{y_2} \varphi(y)\, dy + \sum_{j=1}^{\infty} \frac{Q_j}{(\sqrt{npq})^j}:$$

Uniformly relative to y in any finite interval $a \leq y \leq b$

$$\frac{\Gamma((n+1)/2)}{\sqrt{\pi n}\,\Gamma(n/2)}(1+y^2/n)^{-\frac{n+1}{2}} = \varphi(y)\exp\left[\sum_{j=1}^{\infty}\frac{K_j(y)}{n^j}\right] =$$

$$= \varphi(y)\left[1 + \sum_{j=1}^{\infty}\frac{P_j(y)}{n^j}\right],$$

where

$$K_j(y) = \frac{(-1)^j}{2}\left(\frac{y^{2j}}{j} - \frac{y^{2j+2}}{j+1}\right) - \frac{y^{j+1}-1}{j(j+1)}B_{j+1},$$

$$P_j(y) = \sum \frac{K_1^{\nu_1}(y)\ldots K_j^{\nu_j}(y)}{\nu_1!\ldots\nu_j!}$$

is an even polynomial of degree 4j. This paper was presented by academician Yu. V. Linnik on 10 May 1965. Orig. art. has: 16 formulas.

SUB CODE: 12/ SUBM DATE: 07May65/ ORIG REF: 003/ OTH REF: 003

Card 3/3

L 01481-66   EWT(d)/T   IJP(c)   JXT(cz)

AUTHOR: Kalinin. V. M.

TITLE: Functionals connected with the Poisson distribution and the statistical structure of a text

TOPIC TAGS: statistical analysis, probability theory, language, Poisson distribution

ABSTRACT: It is assumed that a text (speech sample) is a discrete, stationary, random process. A text of N words is characterized by the following functionals: $n(N)$ is the number of different words; $n(m, N)$ is the number of different words, each of which is used m times; $r_m(N)$ is the number of different words, each of which is used more frequently than m times. The author is characterized by the collection of word-usage probabilities p_i ($i = 1, \ldots, L$), where L is the capacity of the author's active vocabulary for the given text. The following three problems

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L 01481-66

ACCESSION NR: AT5018590

are considered: 1) from the functionals of a text of N_0 words to find the func-
tionals of a text of length N (words); 2) to find the functionals of a text from
the characterization of the author; 3) to determine the characterization of the
author from the functionals of the text. It is assumed that word frequency follows
the Poisson distribution and that the word probabilities agree with Zipf's har-
monic law or with Mandelbrot's "canonical" law. The rank l of a word is its number
in a list of words according to decreasing probabilities. The list is called a
probability dictionary. The mathematical expectations of these functionals are
derived to solve these problems. A linguistic interpretation is given, and experi-
mental results are displayed for a sample text. Orig. art. has: 96 formulas, 9
tables.

ASSOCIATION: none

SUBMITTED: 00   ENCL: 00   SUB CODE: MA, DP

NO REF SOV: 003   OTHER: 004

Card 2/2

88343

S/024/60/000/006/010/015
E031/E413

16.9 500 (1031,1121,1132)

AUTHORS: Kalinin, V.N. and Makar'yev, B.M. (Leningrad)

TITLE: The Investigation of Free Oscillations in Non-Linear Automatic Control Systems Using Logarithmic Frequency Characteristics

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, No.6, pp.157-161

TEXT: The elements of the system may be linear (L), non-linear (N) or complicated non-linear elements (K). The investigation is made considering the characteristics as two families of either the amplitude or the frequency for fixed values of the other parameter. Consider first auto-oscillations in a system formed by short-circuiting the K element. On the logarithmic scale, the transfer function splits into two parts and these two equations for the parameters of the auto-oscillations are solved graphically. The stability of the auto-oscillations is determined using the Nyquist criterion. The second case considered is that of a system of the form KL. Again a graphical approach is adopted. This case is of interest because it is equivalent to a system comprising a linear and a non-linear part. The third and last case is that of a

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S/024/60/000/006/010/015
E031/E413

The Investigation of Free Oscillations in Non-Linear Automatic
Control Systems Using Logarithmic Frequency Characteristics

system of the form NL.   For convenience the non-linear elements
are divided into those with and those without hysteresis loops in
their characteristics.   The necessary conditions for the
occurrence of auto-oscillations is the existence of general points
on the curves of the logarithmically equivalent admittance and
characteristic functions of the system.   If these general points
do not exist, this can be regarded as a sufficient condition for the
absence of auto-oscillations.   Systems with non-linear elements of
the first class are more inclined to self-excitation than systems
with elements of the second class.   There are 4 figures and
2 Soviet references.

SUBMITTED: May 24, 1960

Card 2/2

AVDEYEV, A.I.; KALININ, V.N.; FRIDZON, M.V.

Protection of thermoreceivers from the thermal action of solar
radiation when measuring temperature at great heights. Trudy
TSAO no.41:86-90 '62.   (MIRA 16:10)

L 10485-63   EWT(d)/BDS--AFFTC/APGC/ASD--Pg-4/Pk-4/P1-4/Po-4/Pq-4--BC/IJP(C)
ACCESSION NR: AP3000286   S/0020/63/150/001/0021/0022

74

AUTHOR: Kalinin, V. N. (Moscow)

TITLE: The existence of an absolute minimum in a problem of the theory of optimal
processes

SOURCE: AN SSSR. Doklady, v. 150, no. 1, 1963, 21-22

TOPIC TAGS: optimal process, quasi-regularity, absolute minimum, functional
quasi-regularity

ABSTRACT: Definitions of the class U of allowable controls u(t), of the class
Δ of operations A(u, x) determining the controlled process, and of the resolvent
of an operation are given, and the problem of the optimal control is formulated.
The following functional is assumed:

$$I(u) = \int_0^\tau f(x, u, t)\, dt,$$

where f(x,u,t) is a function for which the integral (1) exists (in the sense of
Lebesgue) and is bounded and unique for any allowable control function u ∈ U and

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L 10485-63
ACCESSION NR: AP3000286

for corresponding controlled processes x. It is necessary to establish conditions
under which there exists in the class of allowable functions $u(t)$ a control
function $u^*(t)$ (optimal control) such that the absolute minimum of the function
$I(u)$ is ensured. The definition of the quasi-regularity of the function $I(u)$ in
the class U is presented in the form of certain constraints upon the integrand
$f(x,u,t)$, and optimality conditions are expressed in the following theorem: If
the operation $A(x,t)$ belongs to the set Δ_o, where Δ_o is the set of operations
with a strengthened continuous resolvent, and the functional $I(u)$ is quasi-regular
in U, then a control $u^*(t)$ exists in U such that the absolute minimum of the
functional $I(u)$ is ensured. The article was presented by Academician L. S.
Pontryagin, 23 November 1962. Orig. art. has: 3 formulas.

ASSOCIATION: none

SUBMITTED: 23Nov62   DATE ACQ: 10Jun63   ENCL: 00

SUB CODE: MM   NO REF SOV: 002   OTHER: 001

ss/
Card 2/2

L 55890-65   EWT(l)/EWT(m)/FCC/EWG(v)/EEC-4/EWP(j)/EEC(t)/EWA(h)   Pu-4/Po-4/
Pe-5/Pq-4/Pae-2/Peb/Pi-4   RM/GW

UR/0169/65/000/005/B010/B010

ACCESSION NR: AR5014437   551.508

SOURCE: Ref. zh. Geofizika, Abs. 5B82

AUTHOR: Avdeyev, A.I.; Fridzon, M.B.; Kalinin, V.N.

TITLE: The protection of temperature sensors against radiation

CITED SOURCE: Sb. 150 let Meteorol. observ. Kazansk. un-ta. Kazan', Kazansk. un-t,
1963, 200-212

TOPIC TAGS: meteorological instrument, temperature sensor, stratosphere, anti-
radiation coating, radiation error, silver passivation, silver reflectivity, lacquer
coating, aluminum reflectivity

TRANSLATION: Silver applied to a polished base has the best reflecting properties
of all the coverings used for the protection of stratospheric temperature sensors against
of atmospheric factors. The

reflectivity of samples altered for 24 interval 0.2-10 microns. The reflection
were determined in the wave-length interval 0.2-10 microns.
Card 1/2

L 55890-65
ACCESSION NR: AR5014437   3

measurements show that lacquers B-1 and AV-4, as well as silicon dioxide, decrease the
                    of silver and cannot be recommended for anti-radiation coatings. Passivation
                                              the application of a methacrylic lacquer

make its use highly promising for
large scale. M. Kaganov.

SUB CODE: ES   ENCL: 00

COC

Card 2/2

L 17074-63   EPA(b)/EWT(1)/FCC(w)/FS(v)-2/BDS/ES(v)   AFFTC/AFWDC/
ESD-3/APGC/SSD   Pd-4/Pg-4/Po-4/Pe-4/Pq-4   GW
                                        S/2560/63/000/016/0238/0245
ACCESSION NR: AT3006850   86

AUTHOR: Kalinin, V. N.

TITLE: Equations of motion of an artificial earth satellite

SOURCE: AN SSSR. Iskusst. sputniki Zemli, no. 16, 1963, 238-245

TOPIC TAGS: orbital motion equation, artificial earth satellite,
Coriolis acceleration theorem, controlled satellite motion, cen-
tral gravity field, automatic rendezvousing

ABSTRACT: The derivation of exact equations for a controlled or-
bital motion of an artificial earth satellite (e.g., automatic
rendezvousing or another maneuver in close vicinity of the orbit)
in a central field of gravitation is presented. A moving coordi-
nate system connected with an earth-centered elliptical orbit is
utilized. The Coriolis theorem on the total acceleration of a
mass point is used to derive the equations of satellite motion
and a system of differential equations for acceleration components.

Card 1/2

L 17074-63
ACCESSION NR: AT3006850

An approximate integration of these equations by applying the small-parameter method is briefly discussed. "The author expresses his profound gratitude to F. M. Kilin, B. I. Solomatnikov, A. V. Chetkov, Ye. P. Grigor'yev, and Yu. Ya. Dmitriyev for valuable remarks made during the discussion of the article." Orig. art. has: 2 figures and 46 formulas.

ASSOCIATION: none

SUBMITTED: 15Jul62   DATE ACQ: 08Aug63   ENCL: 00

SUB CODE: AS   NO REF SOV: 001   OTHER: 002

Card 2/2

L 16049-65   EWT(d)/EWP(1)   Po-4/Pq-4/Pg-4/Pu-4/Pk-4/P1-4   IJP(c)   WW/BC
S/0280/64/000/005/0039/0044
ACCESSION NR: AP4048822

AUTHOR: Kalinin, V. N. (Leningrad)

TITLE: Theory of the approximate synthesis of an optimum control

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 5, 1964, 39-44

TOPIC TAGS: optimum control synthesis, approximate synthesis, linear
control system, time optimum control

ABSTRACT: An approximate method is presented for the synthesis of the
time optimal control system described by the linear differential
equation of the form

$$\dot{x} = a(\varepsilon, t)x + bu,\qquad (1)$$

where x is an n-vector of the phase state of the system, u is an r-
r- control vector, a(ε,t) is an n x n matrix, b is a constant
n x r matrix, and ε is a small parameter. The essence of the method

Card 1/2

L 16049-65
ACCESSION NR: AP4048822

consists of the approximate substitution and of a more simple auxiliary problem for the original problem and in estimating the error of approximation. The synthesis of the optimal control system described by the degenerate equation (1) when $\epsilon = 0$ is taken as an auxiliary problem. Assuming that the solution of the auxiliary problem is known, it is shown how this solution can be continued into the domain of nonzero ϵ values. The approximate structure of the controller is presented, and the estimate of the deviation of the control system with the derived controller from the optimal one is derived. An example of the synthesis of a time-optimal second-order control system illustrates the method. Orig. art. has: 5 figures and 31 formulas.

ASSOCIATION: none

SUBMITTED: 15Jan64   ENCL: 00   SUB CODE: IE, MA

                                       OTHER: 001   ATD PRESS: 3141
NO REF SOV: 006

Card 2/2

KALININ, V.N.

Case of dermoid cyst of the liver. Vest. rent. i rad. 39 no.5:
(MIRA 18:3)
(2-63 S-0 '64.

1. Kafedra propedevticheskoy terapii (zav. - prof. V.V. Cherdin)
Volgogradskogo meditsinskogo instituta i rentgenologicheskoye
otdeleniye (zav. V.K. Strelyukhin) Volgogradskoy oblastnoy kli-
nicheskoy bol'nitsy.

L 41040-65   EWT(d)/EPF(n)-2/EWP(1)   Po-4/Pq-4/Pg-4/Pu-4/Pk-4/P1-4   IJP(c)   WW/WC

ACCESSION NR: AP5006287   S/0103/65/026/002/0365/0369

AUTHOR: Kalinin, V. N. (Leningrad)

TITLE: Generalized optimality criteria in optimal-control problems

SOURCE: Avtomatika i telemekhanika, v. 26, no. 2, 1965, 365-369

TOPIC TAGS: optimal control, optimality, automatic control, automatic control design, automatic control system, automatic control theory

ABSTRACT: Optimality criteria are considered which are based on the minimization of functions of several conventional integral functionals in a nonclassic variant of the optimal-control problem. The technique of double minimization based on consideration of an isoperimetric problem is set forth for this functional:

$$I = F(\xi_1, \ldots, \xi_m),$$

where

$$\xi_\mu = \int_0^\tau q_\mu(x, u)\,dt \quad (\mu = 1, \ldots, m),$$

Card 1/2

L 41040-65

ACCESSION NR: AP5006287

and F is the defined function. The optimality criterion connected with the above functional is called the "generalized optimality criterion." This theory is used to find the optimum control for a simplest second-order plant. Orig. art. has: 3 figures and 35 formulas.

ASSOCIATION: none

SUBMITTED: 22Aug63   ENCL: 00   SUB CODE: IE, DP

NO REF SOV: 003   OTHER: 000

Card 2/2

ZAKHARKIN, L.I.; KALININ, V.N.

Reaction of amines with barenes. Izv. AN SSSR. Ser. khim. no.3:
579 '65.
(MIRA 18:5)

1. Institut elementoorganicheskikh soyedinoniy AN SSSR.

ZAKHARKIN, L.I.; KALININ, V.N.

Sequence of substitution in electrophilic halogenation of barenes
(carboranes). Izv. AN SSSR. Ser. khim. no.7:1311 '65.   (MIRA 18:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

L 58347-65   EWT(m)/EPF(c)/EPR/EWP(j)/EWA(c)   Pc—4/Pr—4/Ps—4   RPL   IJP/JW/RM

ACCESSION NR: AP5018083   UR/0020/65/163/001/0110/0112
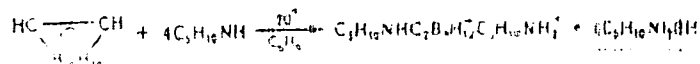
AUTHOR: Zakharkin, L. I.; Kalinin, V. N.

TITLE: Conversion of barenes with amines into salts of dicarbaundecaborane
derivatives

SOURCE: AN SSSR. Doklady, v. 163, no. 1, 1965, 110-112

TOPIC TAGS: barene, borane, dicarbaundecaborane, organoboron

ABSTRACT: Contrary to the findings of some U.S. investigators, it was found that amines
react with barenes to form salts of dicarbaundecaborane derivatives. The reaction
involves cleavage of the barene ring. Thus, barene reacts with piperidine to form
an adduct of piperidine with the piperidinium salt of dicarbaundecaborane:

$$HC \underset{B_{10}H_{10}}{\overline{}} CH + 4C_5H_{10}NH \xrightarrow[C_6H_6]{70°} C_5H_{10}NHC_2B_9H_9C_5H_{10}NH_2^+ \cdot 6C_5H_{10}NH_2OH$$

Mono- and disubstituted barenes react similarly with piperidine in benzene or hex-
ane. Unsymmetrically substituted barenes yield only one anion; this indicates that
the ... atom is abstracted from a definite position in the barene molecule, located
symmetrically with respect to both carbon atoms. Orig. art. has: 2 figures and ... for-
mula.   [VS]
Card 1/2

L 58347-65
ACCESSION NR: AP5018083

ASSOCIATION: Institut elementorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Organoelemental Compounds, Academy of Science, SSSR)

SUBMITTED: 31Dec64   ENCL: 00   SUB CODE: OC, GC

NO REF SOV: 002   OTHER: 005   ATD PRESS: 4042

Card 2/2

ZAKHARKIN, L.I.; KALININ, V.N.; PODVISOTSKAYA, L.S.

Preparation of B-hydroxybarenes by the action of nitric acid
on barenes.   Izv. AN SSSR. Ser. khim. no.9:1713 '65.
(MIRA 18:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

ZAKHARKIN, L.I.; KALININ, V.N.

Cleavage of phenylneobarene by hydrazine into a phenylsec-
dicarbaundecarborane anion. Zhur. ob. khim. 35 no.9:1691-
1692 S '65.

(MIRA 18:10)

L 2558-66   EWT(m)/EPF(c)/EWP(j)/EWA(c)   RPL   JW/RM

ACCESSION NR: AP5025131

UR/0079/65/035/010/1882/1884
547.244

AUTHOR: Zakharkin, L. I.; Kalinin, V. N.

TITLE: Synthesis of carboran- and neocarboran-amines

SOURCE: Zhurnal obshchey khimii, v. 35, no. 10, 1965, 1882-1884

TOPIC TAGS: carborane, neocarborane, amine

ABSTRACT: Carboran- and neocarboran-amines with the NH_2-group at one of the C atoms of the carborane- or neocarborane ring have been synthesized for the first time. The synthesis proceeds in two steps: treatment of the respective and chlorides with sodium azide and heating of the azides formed with concentrated sulfuric acid. Carboran- and neocarboran-amines are soluble in concentrated H_2SO_4. Carboranamines are weak bases due to the electron acceptor effect of the carborane ring and to steric factors. Orig. art. has: 1 table.   [BO]

ASSOCIATION: none

SUBMITTED: 15Mar65
NO REF SOV: 000   ENCL: 00
Card 1/1   OTHER: 000

SUB CODE: OC, GC
ATD PRESS

L 18569-66   EWT(m)/EwP(j)/T   WW/JW/JWD/RM

ACC NR: AP6002702   SOURCE CODE: UR/0062/65/000/012/2206/2209

AUTHORS: Zakharkin, L. I.; Kalinin, V. N.

ORG: Institute for Heteroorganic Compounds, Academy of Sciences, SSSR (Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR)

TITLE: Certain rearrangements of phenylborane and phenylneoborane

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 12, 1965, 2206-2209

TOPIC TAGS: borane, boron compound, organoboron compound

ABSTRACT: A number of substituted phenyl and neophenyl boranes were synthesized to extend the work of L. I. Zakharkin, V. I. Stanko, and A. I. Klimova (Zh obshch. khimii 35, 394, 1965) on the properties of boranes and neoboranes. The reaction yield, melting points, and UV spectra of ethanol solution of the synthesized compounds were determined. The experimental results are presented in graphs and tables (see Fig. 1).

Card 1/2   UDC: 542.91+661.718.4